

We claim:

1. A method of inducing stem cell adhesion, survival, proliferation, or differentiation comprising contacting stem or undifferentiated cells with a combinatorial substrate library comprising discrete regions varying in surface composition, microstructure, and molecules bound thereto.
2. The method of claim 1 wherein discrete regions are coated with one or more bioactive molecules.
3. The method of claim 2 wherein the bioactive molecules are selected from the group consisting of growth factors, extracellular matrix molecules, and cytokines.
4. The method of claim 1 wherein the substrate is a polymer or polymer blend.
5. The method of claim 4 wherein the polymer or polymer blend is biodegradable.
6. The method of claim 1 further comprising identifying discrete regions inducing preferred properties in the cells adhered thereto.
7. The method of claim 1 further comprising differentiating the stem cells into specific lineages following contact with the substrate.
8. The method of claim 7 wherein a specific lineage is an endothelial lineage.
9. A combinatorial substrate library comprising discrete regions varying in surface composition, microstructure, and molecules bound thereto having stem cells or undifferentiated cells adhered thereto.
10. The combinatorial substrate library of claim 9, wherein one or more discrete regions are coated with one or more bioactive molecules.

11. The combinatorial substrate library of claim 10 wherein the bioactive molecules are selected from the group consisting of growth factors, extracellular matrix molecules, and cytokines.

12. The combinatorial substrate library of claim 9, wherein the substrate is a polymer or polymer blend.

13. The combinatorial substrate library of claim 12, wherein the polymer or polymer blend is biodegradable.